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Trembling lest each he met were man of law,
 Now trips in mid-day sun, his debts discharg'd,
 His pocket lin'd with gold. Ah! happy men!
 Till some mischance, haply a flea or bug,
 (Those light-arm'd troops, who marching thro' their realms,
 Attack each straggling stranger) rouses them;
 Vulcan starts up to curse his unpaid score,
 The starving wretch a craving belly owns,
 And the poor debtor lies, and lists, and quakes,
 Lest lurking catchpole should his haunt have trac'd.
 And now the toper thinks of going home;
 Mutt'ring he leaves his haunt, and staggers on,
 In zig-zagcourse, quite happy in himself.
 But scarce he has advanc'd, when, lo! he steps

Mid-leg, in corporate feather-bed. Enrag'd,
 He summons all his strength, and struggles out,
 And, with loud curses, onward steers his course,
 Till, sad to tell! he plunges in again.
 What sound is that? 'tis but the watchman's snore,
 Who having stretched his lungs to bawl the hour,
 Within his box hath crept; and now he dreams
 Of fines and fees, of thieves way-laid and caught,
 And great rewards; and thus his time goes on,
 Till some unlucky rattle's ceaseless din
 Calls forth the hobbling brotherhood to arms.

* * * * *

S. K.

DISCOVERIES AND IMPROVEMENTS IN ARTS, MANUFACTURES, AND AGRICULTURE.

Specification of a Patent granted to Thomas Pearsall, of Willsbridge, in the Parish of Bitton, in the County of Gloucester, Iron-manufacturer; for a method of Constructing Iron-work for certain parts of Buildings.

Dated, October, 30, 1811.

TO all whom these presents shall come, &c. Now know ye, that in compliance with the said proviso, I, the said Thomas Pearsall, do hereby declare, that the nature of my said invention, and in what manner the same is to be performed, is described as follows; that is to say:—the principle of my invention consists in the application and fixing of thin, wrought, or malleable iron plates, in an edgewise position, so as to render them capable of sustaining a very considerable weight. Roofs

are, by this means, constructed to receive any kind of covering, by uniting, by means of rivets, pins, screws, or ties, plates of iron, of the necessary thickness and dimensions for rafters and laths, cut or let one into the other, of a sufficient depth to keep them fixed perfectly in their required position. The rafters are pinned, or otherwise fastened together at the top; and at this point another plate is fastened, falling perpendicularly, which meets and is united to two others, running therefrom on each side of the rafters, and generally as near the foot of the rafters as possible, or according as circumstances may require. These two latter plates are pinned, or otherwise fastened to the rafters, and are what I term the stays. These stays are put on either in a level or diagonal form, or in

a curved form, so as to form an arch. An assemblage of these rafters and stays, connected at certain distances by the laths being wedged or otherwise fastened into the rafters, with the addition, if required, of some crossings or braces on the under side of the rafters and on the stays, laid either flat or edgewise, form a roof. Iron, about three inches and a quarter wide, and about one-eighth of an inch thick, is found sufficiently strong for the rafters, without any support otherwise than as before described, to bear with ease the common pantile on a space of twenty-five feet; the laths and stays of a size in proportion, which I find to be about one inch and three quarters of an inch wide, and one-sixteenth of an inch thick. On the extension of the span supports are introduced in various forms, according to the extent required.

Joists for floors are prepared and laid down by the same method, which unites the rafters and laths; and by the same method also iron is fixed for ceilings and partitions, though occasionally in this work it may be laid flat.

Skeletons for stairs are made on the same principle, to receive steps of wood or stone; and on the same principle also are made doors, windows, and sky-lights, and other things of the like nature.

In addition to the plan specified in the patent, the following extracts are given on Iron-Roofing, from T. D. W. Dearne, Esq. Architect and Engineer. Communicated in a letter to the Editors of the Repository.

THE idea of cast iron roofs is no longer a novelty; but as the progress of improvements is usually slow, and its advancement to perfection progressive, it can hardly be supposed that this subject should

stand alone an instance of the fallacy of the remark, or that human ingenuity should so soon be exhausted on a matter which, though apparently simple, certainly embraces very important consequences.

I have been led to devote some attention to this subject, from having understood, that in those which have been executed, much delay and trouble has been occasioned in fitting the different castings, and that consequently the expense has been much greater than was anticipated.

In the plan now suggested, no disappointments of this kind need occur, nor will it require the presence of a smith in fixing, the parts being so few and simple as to be readily put together by the most ordinary mechanic.

Yet, as what I have to offer on this head is purely speculative, it is possible there may be objections to my scheme, which I am at present unable to discover, and which, though hid in theory, may be glaringly manifest in practice; it is, therefore, with deference, submitted to the attention of your readers.

A single casting, composing two opposite rafters, with a segment collar piece, is proposed for an opening sixteen feet in the clear of the walls. These rafters are nine inches deep, and half an inch thick, with a shoulder on each side, forming a rebut with the upper part of the rafter, and having a bearing of half an inch for the covering. At the meeting of the two rafters above is a notch, rather better than half an inch wide, and one inch and a half deep, to admit the ridge piece, which is also notched half through; this piece, it must be seen, will effectually keep the different castings in their places, and in smaller openings render any interstice between the rafters unnecessary.

The weight of this casting, admit

ting a cubic foot of cast-iron to weigh 464lbs., will be 1cwt. 16lbs., and worth about 20s. per cwt. in London.

The interstices are two inches deep, and half an inch thick, tenoned into the rafters, a mortice being cast in the rafters, rather larger than the tenon of the interstice, and secured by thin oak wedges. The interstices line with the upper part of the shoulder, and are cast to fit against the shoulders of the rafters; these will weigh about $3\frac{1}{2}$ lbs. each.

Where the rafters meet the pitching plate on each side the under part of the rafters, as high as the upper part of the splay to the shoulder, is done away, so as to thrust against the inner side of the plate, and two holes on each side formed through that part of the shoulder which rests on the plate, to screw down the same; the plate at that part being sunk and levelled to receive it.

For the covering of such a roof, a variety of expedients may be offered, the manner of securing the same being alike in all, and as above proposed.

First—A level covering (that is without a raised joint) may be formed with the large Westmoreland slates, and the meeting and side joints properly secured with a composition of the following materials, viz. boiled oil, red and white lead, and litharge.

Secondly—The larger common slates may be used for the purpose, with a loss of one inch only, and rendered water-tight with the above composition.

Thirdly—Plain tiles may be made for the purpose of the usual substance but twelve inches square, and the joints secured as before described.

Fourthly—Feather-edged poplar boarding might be advantageously

used for this purpose, which would form almost as secure a covering (with reference to fire) as any of the preceding. If this is adopted, the following Swedish method of securing wooden roofs should be resorted to. *Tar and charcoal boiled together, mixed to the consistence of mortar, and laid on with a trowel a quarter of an inch thick.*

Whether a reduction in the substance of the rafters could not consistently be made, I am not prepared to state; yet my present opinion is, that they might be reduced in some degree, with equal safety and advantage.

The weight of the cubic foot of cast-iron being as before stated, 464lbs. and the number of cubic inches in the same 1728; any person the least conversant in building may, from this data, be able to determine (with respect to the expense) the comparative advantage or disadvantage of adopting this contrivance in preference to the common mode of roofing. I shall, however, offer one example, which will at once serve to elucidate the subject.

A cast-iron roof twenty feet long, to span an opening sixteen feet wide in the clear of the walls, with a dripping eave on each side, composed of castings, with the necessary interstices, ridge-piece, and fir-plate and screws to the same, will cost as follows:—

Bill of Estimate.

	£.	s.	d.
24cwt. cast iron, in rafters, &c.			
at 20s.	24	0	0
2cwt. 2qrs. 11lb. ditto, ridge-piece and interstices,	2	11	0
14 dozen three inch screws, at 1s. 6d.	1	1	0
2 men, two days each, fixing ditto,	1	4	0
6 feet cubic fir, in plate, at 8s. 6d.	2	11	0
	£31	7	0

A fir roof of the same dimensions, with four pair of principals five by four, collar beams ditto, purlins four by four, common rafters four by three, and plate five by four, will stand thus:

	£.	s.	d.
3 square, 60 feet framing to naked roof, labour, and nails, at per square, 16s.	2	17	7
24 feet cube fir, 8s. 6d.	10	4	0
20 feet run of ridge board, 9d.	0	15	0
40 feet ditto eaves ditto, 6d.	1	0	0
	£.14	16	7

This estimate is made for the neighbourhood of London, and it must be almost needless to observe, that the comparative difference will be greater or less according to circumstances and situation.

Notwithstanding the advantage (on the score of expense) appears (according to these estimates) materially in favour of the wooden roof; yet when it is considered, that a cast iron roof, merely lime whitened on the under side, would, from its peculiar neatness, form not an inelegant ceiling to attic rooms, and that consequently a ceiling floor might be dispensed with; and moreover, that from the circumstance of casting the opposite rafters in one piece, the lateral thrust on the plate would be insignificant, and the use of binders altogether unnecessary; taking these into the account, the balance will not appear so much in favour of the latter, and this difference will be less as we proceed, or rather in favour of the former.

The expense of covering wooden roofs, boarded for slating, with three quarter inch yellow deal, and laid with Welch ladies (the cheapest slate covering), the ridge covered with lead, 5lb. to the foot, and fillets drawn against the flank walls, will be as follows:

	£.	s.	d.
3 $\frac{3}{4}$ square slating, at 55s.	10	6	3
3 $\frac{3}{4}$ square, $\frac{3}{4}$ inch boarding, at 47s.	8	16	3
1cwt. 1qr. 10lb. milled lead, labour, &c. at 50s.	3	6	11 $\frac{1}{2}$
36 feet run of filleting to flank walls, 2d.	0	6	0
	£.22	15	5 $\frac{1}{2}$

Cast-Iron Roof.

To cover ditto with the stoutest Westmoreland slates, the meeting joints secured with the composition before-mentioned, &c. pinned with oak pins, and fillets drawn, &c., labour and all materials, at per square 60s., £11 5s.

The same covered with plain tiles, 12 inches squares, secured and jointed as above, and labour and all materials, at per square 32s., £6.

The same covered with large Welch slating, with a lap of one inch, pinned and joints secured, may be executed for 42s. per square,—£7 17s. 6d.

The poplar feather-edged boarding, coated with the Swedish composition, may be done well I should suppose for 30s. per square; that is for the whole roof, £5 12s. 6d.

But as poplar has no market price, it is impossible to fix a positive value on the above; but suppose what I have stated to be sufficient.

On this occasion I have been rather desirous of simplifying the received and general opinions on this point, than studious of advancing an ingenious, but perhaps useless novelty of my own, and my only object, that of rendering subservient to the common purposes of life, an idea which must ultimately prove of much individual and public advantage.

The particular merits of this contrivance may be thus enumerated.

That it is altogether more economical than wooden roofs.

2. That it is more durable.

3. That from the simplicity of its parts, it may be readily put together by persons wholly unacquainted with any of the mechanic arts connected with building.

4. That the covering can be more easily and more effectually repaired than that of any other roof whatever.

And its general merit in common with other cast-iron roofs, is the resistance which it opposes to fire, and the little injury it is likely, itself, to suffer from it.

Specification of the Patent granted to Joseph Baker, of Butler's-Green, near Cuckfield, in the County of Sussex, Navy-contractor; for kneading Dough by means of Machinery. Dated Nov. 23, 1811.

To all to whom these presents shall come, &c. Now know ye, that in compliance with the said proviso, I the said Joseph Baker do hereby declare, that the nature of my said invention is as follows; that is to say: The principle of the invention for kneading dough is to amalgamate flour, or meal, or pulse, of any kind, with water, in a circular trough, having an upright shaft, turning on a pivot, fixed in the centre of the machine, so that the dough placed in such trough may be kneaded by a stone or iron roller, on its edge, passing over it in a rotary motion, being fixed at a due distance, by an horizontal bar or axle to the shaft, which is to be turned by means of one or more other horizontal bars likewise fixed thereto, and worked like a capstern, by a proportionate number of bipeds or quadrupeds, such horizontal bars having small shares fixed to them, so as to run in the trough, and, acting like a plough, cause the dough to present fresh surfaces for each successive revolution.

This kneading machine may be made in metal of any kind, or wood of any kind, or thin compositions or combinations; perhaps the preferable way would be to make the foundation of brick or stone, to make the trough of stone or iron, to make the upright shaft of wood, cramp with iron, and the steps in which the iron pivots are, of flint or metal, and the shares of iron.

Observations by the Patentee.

This mode of kneading dough, it is hoped, will not only do away the present method of hand-working, which is imperfect and expensive, but may be the means of abolishing the more general and filthy practice of kneading, by treading with the feet, where the business of baking is carried on to any considerable extent. It is almost needless to remark, that the quantity of water absorbed, and the good quality of the bread, depends much on good kneading; and that lightness and taste are much improved by the dough receiving the necessary working. To those, therefore, who are attentive to these particulars, this invention affords the means of great saving. In making biscuits for the use of shipping, the advantage is considerable, both in regard to taste and the power of keeping.

Specification of the Patent granted to John Miers, of the Strand, in the precinct of the Savoy, in the County of Middlesex, Jeweller; for a method of accelerating the Evaporation of fluid or liquid Bodies, of destroying the noxious and offensive Effluvia arising from spent Lees, or other liquid, fluid or solid substances, and of generating an increased degree of heat, without additional Fuel.

Dated October, 30, 1811.

To all to whom these presents shall come, &c. Now know ye, that in